

1. (Currently Amended) A method for identifying a compound which modulates for use in modulating, for example promoting, the activation or phosphorylation of an AMPK (AMP-activated protein kinase) or AMPK an AMP-activated protein kinase subfamily member in a cell, the method comprising the steps of (1) determining whether a test compound modulates, for example promotes, the protein kinase activity of LKB1 and (2) selecting a compound which modulates, for example promotes, the protein kinase activity of LKB1, wherein the LKB1 is in a preparation with comprising STRAD and/or or MO25 or both.

2. (Original) The method of claim 1 wherein the LKB1, STRAD or MO25 is recombinant and which is expressed from a recombinant nucleic acid.

3. (Original) A purified preparation comprising LKB1, STRAD and recombinant MO25 expressed from a recombinant nucleic acid.

4. (Currently Amended) The preparation of claim 4 3 comprising recombinant LKB1 expressed from a recombinant nucleic acid.

5. (Currently Amended) The preparation of claim 3or 4 comprising recombinant STRAD expressed from a recombinant nucleic acid.

6. (Original) A cell capable of expressing LKB1, STRAD and overexpressed or recombinant MO25 expressed from a recombinant nucleic acid.

7. (Original) The cell of claim 6 comprising a recombinant nucleic acid encoding MO25.

8. (Currently Amended) The cell of claim 6 or 7 comprising a recombinant nucleic acid encoding LKB1.

9. (Currently Amended) The cell of ~~any one of claims 6 to claim~~ 8 comprising a recombinant nucleic acid encoding STRAD.

10. (Original) A cell comprising LKB1, STRAD and overexpressed or recombinant MO25 expressed from a recombinant nucleic acid.

11. (Original) A cell according to claim 10 comprising recombinant LKB1 expressed from a recombinant nucleic acid.

12. (Currently Amended) A cell according to claim 10 or 11 comprising recombinant STRAD expressed from a recombinant nucleic acid.

13. Canceled

14. (Currently Amended) A method for making a purified preparation comprising LKB1, STRAD and recombinant MO25 expressed from a recombinant nucleic acid according to any one of claims 3 to 5 comprising:

selecting a cell according to claim 10 and
the step of purifying the preparation from a the cell according to any one of claims 10 to 13.

15. Canceled

16. (Currently Amended) The preparation of ~~any one of claims~~ claim 3 to 5 or 15 wherein the LKB1:STRAD:M025 ratios are 1:1:1.

17. Canceled

18. Canceled

19. (Currently Amended) A method for identifying a compound for modulating cellular LKB1 activity, the method comprising the steps of (1) determining whether a test compound modulates the LKB1 protein kinase activity of a preparation ~~or complex as defined in any one of claims according to claim 3 to 5, 15, 16 or 18 or in a cell as defined in any one of claims 6 to 13~~ and (2) selecting a compound which modulates the said LKB1 protein kinase activity.

20. (Currently Amended) The method of ~~claim 1 or claim 19~~ wherein the LKB1 protein kinase activity is measured using ~~an AMPK or an AMPK subfamily member or a fragment either thereof as the substrate.~~

21. (Currently Amended) A kit of parts comprising ~~the preparation of claim 3 LKB1 or a recombinant polynucleotide encoding LKB1, STRAD or a recombinant polynucleotide encoding STRAD, and M025 or a recombinant polynucleotide encoding M025.~~

22. (Currently Amended) A kit of parts ~~according to claim 21 further comprising (1) an AMPK or an AMPK subfamily member, or recombinant polynucleotide encoding AMPK or AMPK subfamily member or a fragment thereof and (2) a kit of parts as defined in claim 21 or a preparation or complex as defined~~

~~in any one of claims 3 to 5, 15, 16 or 18 or a cell as defined in any one of claims 6 to 13.~~

23. (Currently Amended) A method for overexpressing LKB1 comprising the steps of (1) selecting a cell type according to claim 6 in which to overexpress LKB1, comprising the step of determining whether the cell type is one that expresses STRAD and/or MO25 and (2) overexpressing LKB1 in the selected cell type.

24. (Currently Amended) A method according to claim 23 further for preparing LKB1 comprising the steps of (1) overexpressing LKB1 in a cell using a method according to claim 23 and (2) preparing LKB1 from the cell.

25. (Original) A method for identifying a putative binding partner for MO25 comprising the steps of (1) providing an amino acid sequence of at least the C-terminal three amino acids of a test putative binding partner (2) selecting a putative binding partner having the C-terminal amino acid sequence Trp-Glu/Asp-Phe.

26. (Original) The method of claim 25 further comprising the step of determining that the selected putative binding partner binds to MO25.

27. (Original) A method for identifying a genetic difference associated with PJS (Peutz-Jeghers Syndrome) comprising the steps of (1) investigating the sequence of a gene encoding a MO25 isoform in at least one patient having PJS (2) identifying any difference between the said patient sequence and equivalent sequence from an individual without PJS.

28. (Original) A method for determining whether an individual is susceptible to PJS comprising the steps of determining whether the test individual has a genetic difference identified as associated with PJS by a method according to claim 27.

29. (Currently Amended) A method for identifying a compound which activates an AMPK or an AMPK subfamily member by a similar mechanism to metformin or phenformin or AICA riboside comprising comparing in which the effect of a test compound on the activation of the AMPK or the AMPK subfamily member by a preparation or complex as defined in any one of claims according to claim 3 to 5, 15, 16 or 18 or a cell as defined in any one of claims 6 to 13 is compared with the effect of metformin or phenformin or AICA riboside on the activation of the AMPK or the AMPK subfamily member and selecting the a compound with a similar effect is selected.

30. Canceled

31. (Currently Amended) The method of any one of claims 1, 20 or 29, kit of parts of claim 22, or use of claim 30 wherein the AMPK subfamily member is or comprises an AMPK α 1 or AMPK α 2 polypeptide.

32. (Currently Amended) The method of any one of claims 1, 20, 29, kit of parts of claim 22 or use of claim 30 wherein the AMPK subfamily member is or comprises a NUAK1, NUAK2, BRSK1, BRSK2, SIK, QIK, QSK, MARK1, MARK2, MARK3, MARK4 or MELK polypeptide.

33. (Currently Amended) A peptide substrate for LKB1 comprising the amino acid sequence SEQ ID NO:23, SEQ ID NO:24, SEQ ID NO:25, SEQ ID NO:29, SEQ ID NO:31, SEQ ID NO:33, SEQ ID

NO:35, SEQ ID NO:37, LSNLYHQGKFLQTFCGSPLY (SEQ ID NO:16), or FGNFYKSGEPLSTWCGSPPY (SEQ ID NO:17), or LSNMMSDGEFLRTSCGSPNY (SEQ ID NO:18), or MASLQVGDSLLETSCGSPHY (SEQ ID NO:19), or FSNEFTVGGKLD~~T~~FCGSPPY (SEQ ID NO:20), or AKPKGNKD~~Y~~H~~L~~QTCCGSLAY (SEQ ID NO:21); or a said amino acid sequence with from one to four substitutions therein at any position other than the underlined residue and/or a conservative substitution at the underlined residue; or at least ten contiguous residues of a said sequence encompassing the underlined residue.

34. (Currently Amended) A peptide substrate for LKB1 according to claim 1 consisting of the amino acid sequence LSNLYHQGKFLQTFCGSPLY (SEQ ID NO:16), or LSNLYHQGKFLQTFCGSPLYRRR (SEQ ID NO:23), or SNLYHQGKFLQTFCGSPLY (SEQ ID NO:24), or SNLYHQGKFLQTFCGSPLYRRR (SEQ ID NO:25), or LSNLYHQGKFLQTFCGSPLY or LSNLYHQGKFLQTFCGSPLYRRR or FGNFYKSGEPLSTWCGSPPY (SEQ ID NO:17), or FGNFYKSGEPLSTWCGSPPYRRR (SEQ ID NO:29), or LSNMMSDGEFLRTSCGSPNY (SEQ ID NO:18), or LSNMMSDGEFLRTSCGSPNYRRR (SEQ ID NO:31), or MASLQVGDSLLETSCGSPHY (SEQ ID NO: 19), or MASLQVGDSLLETSCGSPHYRRR (SEQ ID NO:33), or FSNEFTVGGKLD~~T~~FCGSPPY (SEQ ID NO: 20), or FSNEFTVGGKLD~~T~~FCGSPPYRRR (SEQ ID NO: 35), or AKPKGNKD~~Y~~H~~L~~QTCCGSLAY (SEQ ID NO: 21), or AKPKGNKD~~Y~~H~~L~~QTCCGSLAYRRR (SEQ ID NO: 37) .

35. (Currently Amended) An antibody reactive with a peptide antigen having the amino acid sequence MVAGLTLGKG~~P~~E~~S~~PDGDVS (SEQ ID NO: 38) (residues 1-20 of human BRSK1), LSWGAGLKGQKVATSYESSL (SEQ ID NO: 39) (residues 655-674 of human BRSK2), MEGAAAPVAGDRPDLGLGAPG (SEQ ID NO: 40) (residues 1-21 of human NUAK1), TDCQEVTATYRQALRVCSKLT (SEQ ID NO: 41) (residues 653-673 of human NUAK2),

MVMADGPRHLQRGPVRVGFYD (SEQ ID NO: 42) (residues 1-21 of human QIK), MVIMSEFSADPAGQGQQK (SEQ ID NO: 43) (residues 1-20 of human SIK), GDCEMEDLMPCSLGTFVLVQ (SEQ ID NO: 44) (residues 765-784 of human SIK), TDILLSYKHPEVSFSMEQAGV (SEQ ID NO: 45) (residues 1349-1369 of human QSK), SGTSIAFKNIASKIANELKL (SEQ ID NO: 46) (residues 776-795 of human MARK1), MSSRTVLAPGNDRNSDTHGT (SEQ ID NO: 47) (residues 1-20 of human MARK4), MKDYDELLKYYELHETIGTG (SEQ ID NO: 48) (residues 1-20 of human MELK), CTSPPDSFLDDHHLTR (SEQ ID NO: 49) (residues 344-358 of rat AMPK α 1), CDPMKRATIKDIRE (SEQ ID NO: 50) (residues 252 to 264 of rat AMPK α 1).

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